

Remarks

Applicant thanks the Examiner for her courtesy in a telephone interview with the undersigned on August 25, 2006. During the interview, the claims and the Welch reference were discussed. The Examiner explained her position that the term "maintaining" does not require active control, but encompasses any case in which the temperature does not change. The undersigned discussed a possible amendment to specify "actively controlling" the temperature. The Examiner indicated that an "actively controlling" limitation would require further search or consideration with a request for continuing examination.

Submitted herewith is a **Request for Continued Examination** under 37 C.F.R. § 1.114 and a **Petition for One-Month Extension** under 37 C.F.R. § 1.136(a). By this preliminary amendment, Applicant advances prosecution by amending the independent claims. The claims as amended are not met by the prior art of record and there is no basis to assert that the invention claimed as a whole would have been obvious. Reconsideration and allowance are requested.

The Advisory Action dated August 17, 2006 maintained the rejection under 35 U.S.C. § 103(a) in view of Welch et al., U.S. Patent Publication No. 2004-0065645 ("Welch").

Applicant has amended independent claims 9 and 15. Support for the amendments can be found throughout the specification and the drawings and particularly paragraphs [0020] – [0023]. No new matter has been added.

Independent claim 9 requires: "actively controlling a dome temperature, wherein said active control includes said proportional adjustment of said continuously variable CDA flow, so as to maintain a predefined temperature inside a dome of the semiconductor processor . . . when substrate processing is idle." Independent claim 15 requires, "actively controlling a dome temperature, wherein said active control includes said continuous varying of said CDA flow such that said dome temperature is stabilized in accordance with a preset temperature . . . when processing is idle." Welch does not disclose or suggest actively controlling a dome temperature to maintain a predefined temperature, or active control of a dome temperature to stabilize it according to a preset temperature, during idling, a feature of claims 9 and 15, respectively; nor, would Welch have motivated one of ordinary skill in the art of semiconductor processing at the time Applicant's invention was made to modify the teachings of Welch to achieve such a method.

The Advisory Action alleges that Figures 6 and 7 of Welch, as well as paragraphs [0099] and [0101], teach a temperature-controlled idling process. Significantly, neither of these figures, nor their accompanying text discloses or suggests anything related to active control of a dome temperature during process idling.

Figure 6 in Welch is a graph of temperature versus time for three different dome configurations, one of which is an embodiment of the Welch disclosure. Time zero, the beginning point of the x-axis, is the time that plasma strikes the dome. There are no temperature measurements made prior to plasma striking the dome; that is, there are no temperature measurements recorded covering the period when the domes of Figure 6 are idling. Thus, there is no way to possibly know the conditions or control states of any of the domes of Figure 6 while they were idling (before time zero) – temperature control or otherwise.

More importantly, nothing in Welch discloses or suggests that active control conditions produced the temperature at time zero. The Action alleges that, since the temperature at time zero is close to the final temperature, the temperature must have been maintained prior to time zero. However, any assumption of active control during idling by Welch would be based on improper logic, and has no support in Welch. Although an active temperature control can result in a given temperature, the converse is not true. The existence of a given initial temperature as a starting condition in a graph cannot prove anything about the presence or absence of active control prior to time zero. Any finding of active control at time zero in FIG. 6 would be based on application of incorrect logic and impermissible hindsight.

Welch's disclosure "describes a method for increasing the efficiency of, and reducing the time required to stabilize or control the temperature of the dome of a chamber once RF energy has been applied." Figure 6 and paragraph [0099] clearly support Applicant's position and, contrary to the Action's allegation, do not disclose or suggest anything related to the operational parameters of a temperature controlled idling process.

Figure 7 in Welch is a graph of temperature versus time, in which an embodiment of Welch's dome is experimentally tested in four consecutive test runs. The Examiner alleges that, the apparently small temperature drops between the flat periods (when RF power is supplied) indicate that the temperature must have been maintained while the process is idle. Clearly, FIG. 7 shows that the temperature does drop when the process is idle. The Examiner has not introduced any evidence showing the natural thermal response of the system when there is no active thermal control during process idle times. The Examiner has not shown that the drop in temperature in FIG. 7 is in any way different from the drop in temperature that would be observed in the very brief interval between RF power runs if the temperature is not actively

controlled during process idle times. The data shown in FIG. 7 would just as likely show the temperature for the case where the temperature is NOT actively controlled during process idle time, and is only controlled when RF power is supplied. The claimed features cannot be found as motivated by Welch without the use of impermissible hindsight. There is simply a lack of factual data to support such an allegation.

Figure 7 discloses temperature stabilization during RF power application. This is indicated, according to the Action, by the relatively horizontal lines between T_2 and T_3 . However, comparing the period where no RF power is being applied, between T_3 and the subsequent T_2 , Figure 7 shows an absolute lack of linearity for any of the temperature measurements during the period where no RF power is being applied. If Figure 7 "indicates" or "implies" anything, it is evidence that there is no active temperature control during the period when RF power is not supplied to the dome. The totality of Figure 7 and its accompanying textual descriptions, support what Welch has disclosed; namely rapid temperature stabilization once RF power has been applied. Figure 7 does not however, support in any manner a disclosure or suggestion of active temperature control during process idling.

Welch states in paragraph [0102] that Figure 7 shows that steady temperature can be achieved within 33% of the deposition cycle, whereas the prior art had difficulty achieving any steady temperature. Welch states that the temperature fluctuation range of 7 – 10 degrees is significantly improved over the prior art's 25 degree fluctuation range. However, at no point does Welch indicate or even mention process idling in conjunction with Figure 7. Welch discusses temperature control during RF power application, and the improvements he has gained. The Patent and Trademark Office has not introduced any evidence that Welch's reduction in time

to reach steady state and in temperature fluctuation is due to anything other than controlling temperature during application of RF power, as Welch describes.

Welch, at most, describes a method for reducing the time required to stabilize or control the temperature of the dome of a chamber once RF energy has been applied, i.e., at the initiation of and during the substrate processing. Nowhere in Welch is there any disclosure or suggestion, explicit or implicit, of a mechanism or method for actively controlling a predefined temperature inside the dome of a semiconductor processor once the process is idle, as is claimed by Applicant.

In order to establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and the prior art reference (or references when combined) must teach or suggest all of the claim limitations.

MPEP § 2142. The Patent and Trademark Office has not satisfied these requirements, and therefore has failed to establish a prima facie case of obviousness.

Thus, the Action has not shown that Welch discloses or suggests all of the claim limitations found in Applicant's independent claims 9 and 15, and as such, the Patent and Trademark Office has not established a prima facie case of obviousness required by MPEP § 2142.

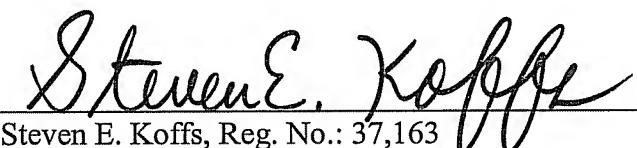
Claims 10 – 14 and 16 – 19 are dependent upon independent claims 9 and 15 respectively, and thus should be allowable at least through dependency.

In view of the foregoing remarks, Applicant submits that this application is in condition for allowance. Early notification to that effect is respectfully requested.

The Assistant Commissioner for Patents is hereby authorized to charge any additional fees or credit any excess payment that may be associated with this communication to deposit account **04-1679.**

Respectfully submitted,

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